Sandia National Laboratories

Categories of Waste in the United States

Background

In the United States, radioactive waste is generally defined by the use from which it was generated, as opposed to its actual hazard in terms of radioactivity. Below is listed the various categories of radioactive wastes.

- Spent Nuclear Fuel - Generated from defense or civilian power reactors
- High-Level Wastes - Generated from reprocessing of nuclear fuel
- Transuranic Waste - Generated primarily from nuclear weapons production
- Low-Level Wastes - Generated from commercial and defense sources, including medical and industrial

Spent Nuclear Fuel and High-Level Wastes are to be stored at Yucca Mountain. Transuranic Waste is the only waste emplaced at the Waste Isolation Pilot Plant.

Spent Nuclear Fuel (SNF)

- Depleted fuel from commercial or government-owned reactors.
- Physically and radioactively "hot" - must be handled, transported, and stored using heavy shielding and neutron moderation materials with provisions for appropriate heat venting.
- Spent Nuclear Fuel is seen as a resource in many other countries. It is very often reprocessed and generated into new fuel.

High-Level Waste (HLW)

- Radioactive waste generated from reprocessing SNF, research reactor and production reaactor fuels, irradiated targets, and naval propulsion
- Exists in a variety of physical forms (e.g., alkaline or acidic supernatant liquid, sludge, salt cake, in vitrified glass, or calcine solid), all of which must be stored behind heavy shielding and usually in underground tanks or bins.

Transuranic Waste (TRU)

- Man-made radioactive waste (arising from nuclear weapons production and reprocessing of SNF.
- Contains radioactive elements whose atoms are heavier than uranium, are alpha particle emitting with a half-life longer than 20 years, and a concentration greater than 100 nano-curies per gram of waste.
- Does not generally produce high levels of penetrating radiation but is dangerous if ingested or inhaled.

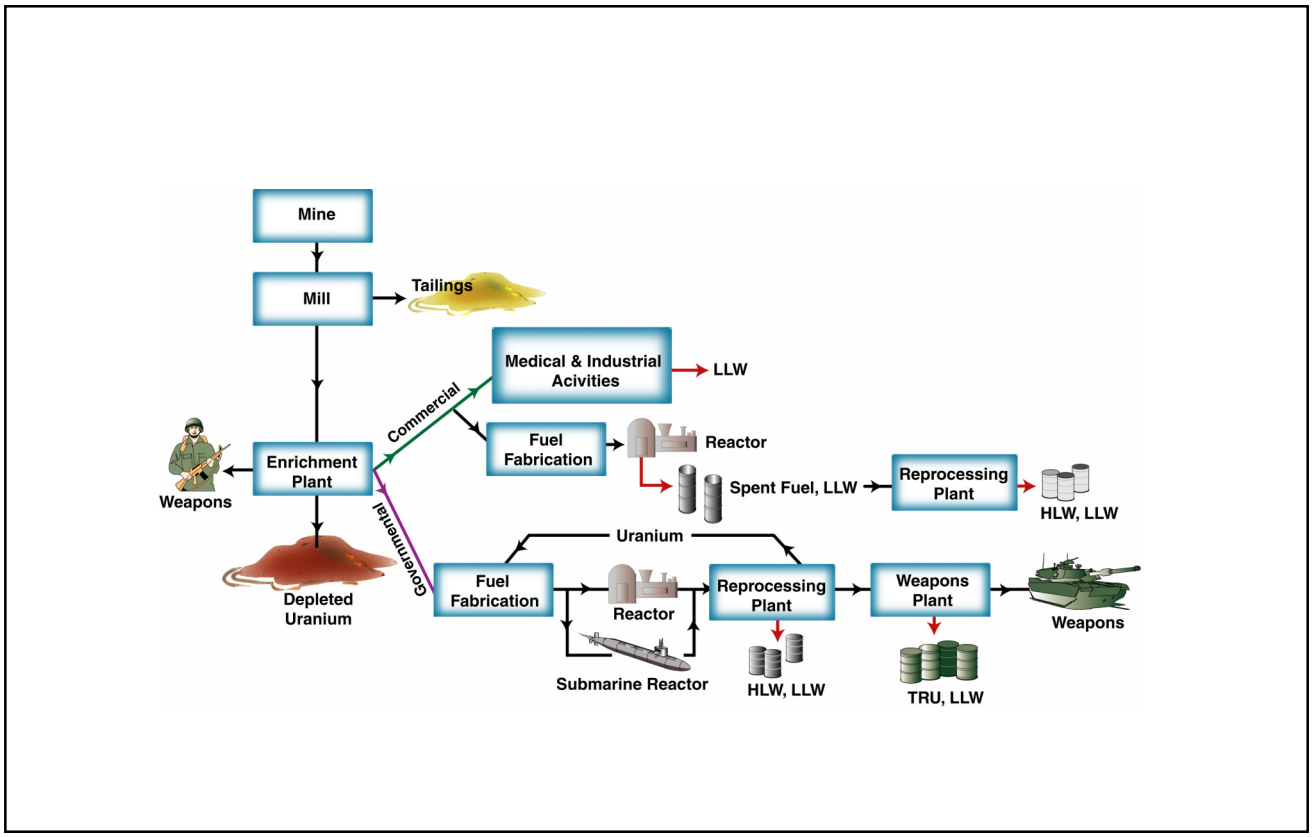
Sandia is a multiprogram laboratory operated by Sandia corporation, a Lockheed Martin Company, for the United States Department of Energy under contract DE-AC04-94AL85000.
SAND2001-2868P

Sandia National Laboratories

Low-Level Waste (LLW)

Any waste contaminated with radioactivity that is not otherwise defined as one of the above waste categories. It is defined by what it is not, as opposed to what it is!

- Class A: Intended to be safe after 100 years
- Class B: Intended to be safe after 300 years
- Class C: Intended to be safe after 500 years
- Greater than Class C (GTCC): The most hazardous of the classes of LLW, containing concentrations of certain radionuclides (e.g., C14, Ni59, Nb94, Co60, Tc99, I129, Sr90, and Cs137) above the Class C limits; not typically disposed of in shallow land burial sites or commingled with Class A, B, and C low-level wastes.



Contacts

Margaret S. Y. Chu
Nuclear Waste Management Program
Sandia National Laboratories
P.O. Box 5800, MS 0771
Albuquerque, New Mexico 87185

Phone: (505) 844-9931
Fax: (505) 844-0591
Email: msychu@sandia.gov

Peter B. Davies
Geoscience and Environment Center
Sandia National Laboratories
P.O. Box 5800, MS 0701
Albuquerque, New Mexico 87185

Phone: (505) 844-3072
Fax: (505) 844-0591
Email: pbdavie@sandia.gov